

Application No. 10/709,688
Docket No. 13DV-14039-3
Amendment dated January 23, 2006
Reply to Office Action of September 23, 2005

REMARKS

In the Office Action, the Examiner reviewed claims 1-9 of the above-identified US Patent Application, with the result that independent claim 1 and its dependent claims 2 and 3 were rejected, independent claim 9 was allowed, and claims 4-8 (which depend from claim 1) were deemed to recite allowable subject matter. In response, Applicants have amended the specification and claims as set forth above. More particularly:

The specification has been amended to update the status of two U.S. patent applications that issued after the filing of the present application.

The abstract has been amended to be more descriptive of the invention recited in the claims and to address a grammatical error.

Independent claim 1 has been amended to recite that the vapor cloud (34) has a composition comprising the oxide compounds of the evaporation source (10), and that the "removing means" is "responsive to changes in the composition of the vapor cloud" so as to remove the preventing means (36) when "the composition of the vapor cloud has changed. . . ." Support for these amendments can be found in Applicants' specification at paragraph [0022].

New dependent claims 10-15 (which depend from independent claim 9) have been presented corresponding to original dependent claims 3-6 and 8 (which depend from independent claim 1). Because claim 9 is allowed, its new

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dependent claims 10-15 are also believed to be allowable over the prior art of record.

New dependent claims 16-18 (which depend from independent claim 9) and new dependent claims 19 and 20 (which depend from independent claim 1) have been presented to recite limitations that find support in paragraph [0022] of Applicants' specification.

Applicants believe that the above amendments do not present new matter. Favorable reconsideration and allowance of remaining claims 1-20 are respectfully requested in view of the above amendments and the following remarks.

Rejections under 35 USC §103

Independent claim 1 and its dependent claims 2 and 3 were rejected under 35 USC §102 and/or §103(a) in view of U.S. Patent No. 5,015,492 to Venkatesan et al. (Venkatesan) and in view of U.S. Patent Application Publication No. 2002/0110698 to Singh. Applicants respectfully traverse each of these rejections in view of the above amendments to claim 1 and the following comments.

Applicants' invention recited in independent claim 1 is directed to an apparatus for depositing on a component (30) a ceramic coating (32) formed of

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multiple different oxide compounds, at least one of which has a vapor pressure that is higher than the other oxide compounds in the coating (32). The apparatus projects a high energy beam (26) on an evaporation source (10) that contains the multiple different oxide compounds, including the compound having the higher vapor pressure. The high energy beam (26) melts the oxide compounds and forms a vapor cloud (34) whose composition comprises the oxide compounds. The apparatus further includes means (36) for preventing the vapor cloud (34) from contacting and condensing on the component (30) during an initial phase in which the composition of the vapor cloud (34) is such that the relative amount of the higher-vapor pressure oxide compound in the vapor cloud is greater than the relative amount of the higher-vapor pressure oxide compound in the evaporation source (10). The apparatus employs a means that is responsive to changes in the composition of the vapor cloud (34), so as to remove the preventing means (36) and allow the vapor cloud (34) to contact and condense on the component (30) during a subsequent phase in which the composition of the vapor cloud (34) has changed to the extent that the relative amount of the higher-vapor pressure oxide compound in the vapor cloud (34) is approximately equal to the relative amount of the higher-vapor pressure oxide compound in the evaporation source (10).

Under the §103 rejection, the Examiner cited Venkatesan and Singh

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for disclosing a shutter 46 and shield 118, respectively, capable of interrupting deposition of a coating on a substrate when inserted between the substrate and an evaporation source of the coating. However, neither Venkatesan nor Singh disclose their shutter or shield as being "responsive to changes in the composition of the vapor cloud," as now required in amended claim 1. Instead, Venkatesan's shutter 46 is employed to ensure that the lobe 36 of the evaporant plume is centered in an aperture 33 through which the evaporant must pass to deposit on Venkatesan's substrate 11 (column 7, lines 6-66), and Singh's shield 118 is employed to simply periodically interrupt deposition to create a coating with discrete columnar layers (paragraphs [0046]-[0047]).

In view of the above, Applicants believe that the prior art does not disclose or suggest Applicants' apparatus now recited in claim 1 as including means that is responsive to changes in the composition of a vapor cloud for the purpose of operating a means capable of preventing coating deposition. Applicants therefore respectfully request withdrawal of the rejections to the claims under 35 USC §102 and §103.

Closing

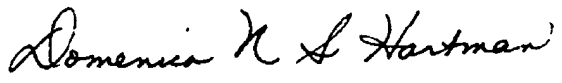
Applicants believe that all issues outstanding from the Office Action have been addressed, and that the claims define patentable novelty over all the

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references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

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Attachments: Replacement Abstract of Disclosure; Petition for Extension of Time

ABSTRACT OF DISCLOSURE

An apparatus ~~A process and apparatus~~ for depositing a ceramic coating on a component. The apparatus includes ~~process involves a technique for evaporating~~ an evaporation source containing multiple different oxide compounds, at least one of the oxide compounds having a vapor pressure that is higher than the remaining oxide compounds, to deposit on the component ~~depositing~~ a coating of the multiple oxide compounds. The apparatus further includes a device for introducing the evaporation source into a coating chamber, a device for suspending the component near the evaporation source, a device for projecting a high-energy beam on the evaporation source to melt and form a vapor cloud of the oxide compounds of the evaporation source, a device capable of preventing the vapor cloud from contacting and condensing on the component, and a device for moving the preventing device to allow the vapor cloud to contact and condense on the component. ~~A high energy beam is projected onto the evaporation source to melt and form a vapor cloud of the oxide compounds of the evaporation source, while preventing the vapor cloud from contacting and condensing on the component during an initial phase in which the relative amount of the one oxide compound in the vapor cloud is greater than its relative amount in the evaporation source. During a subsequent phase in which the relative amount of the one oxide compound in the vapor cloud has decreased to something approximately equal to its relative amount in the evaporation source, the vapor cloud is allowed to contact and condense on the component to form the coating.~~